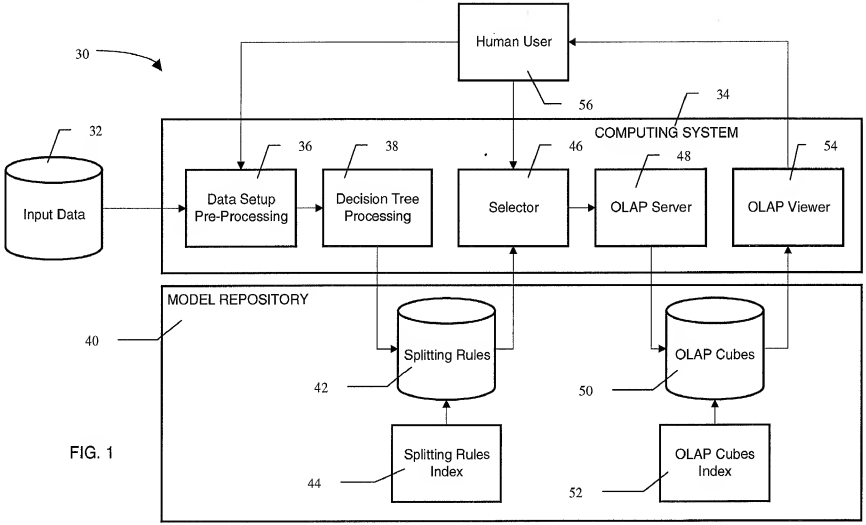

30
Human User
56
34
COMPUTING SYSTEM
32
36
38
46
48
54
Input Data
Data Setup Pre-Processing
Decision Tree Processing
Selector
OLAP Server
OLAP Viewer
MODEL REPOSITORY
40
Splitting Rules
OLAP Cubes
42
50
Splitting Rules Index
OLAP Cubes Index
44
52

FIG. 1

FIG. 2

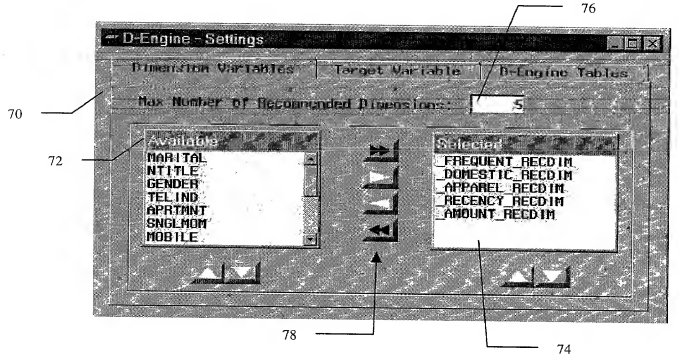

76
D-Engine - Settings
Dimension Variables
Target Variable
D-Engine Tables
70
Max Number of Recommended Dimensions:
5
72
Available
MARITAL
NTITLE
GENDER
TELIND
APRTMNT
SNGLMOM
MOBILE
Selected
_FREQUENT_RECDIM
_DOMESTIC_RECDIM
_APPAREL_RECDIM
_RECENCY_RECDIM
_AMOUNT_RECDIM
78
74

FIG. 3

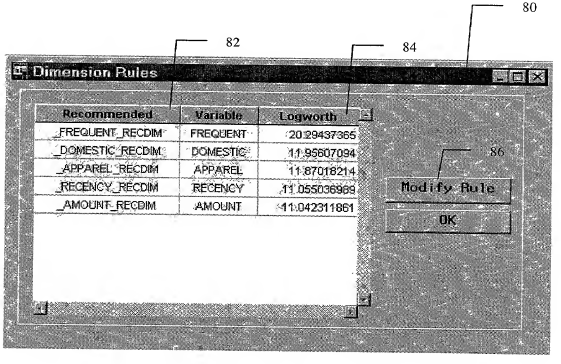

80
82
84
Dimension Rules
Recommended
Variable
Logworth
_FREQUENT_RECDIM
FREQUENT
20.29437365
_DOMESTIC_RECDIM
DOMESTIC
11.95607094
_APPAREL_RECDIM
APPAREL
11.87018214
_RECENCY_RECDIM
RECENCY
11.055036989
_AMOUNT_RECDIM
AMOUNT
11.042311861
86
Modify Rule
OK

FIG. 4

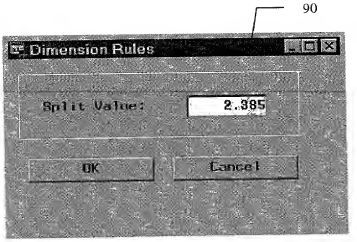

90
Dimension Rules
Split Value:
2.385
OK
Cancel

FIG. 5

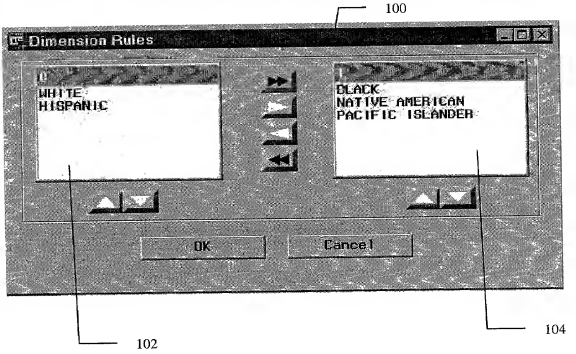

100
Dimension Rules
0
WHITE
HISPANIC
1
BLACK
NATIVE AMERICAN
PACIFIC ISLANDER
OK
Cancel
102
104

FIG. 6

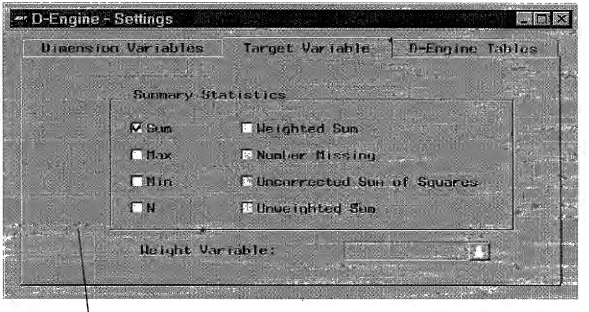

D-Engine - Settings
Dimension Variables
Target Variable
D-Engine Tables
Summary Statistics
Sum
Weighted Sum
Mean
Number Missing
Min
Uncorrected Sum of Squares
N
Unweighted Sum
Weight Variable:
110

FIG. 7

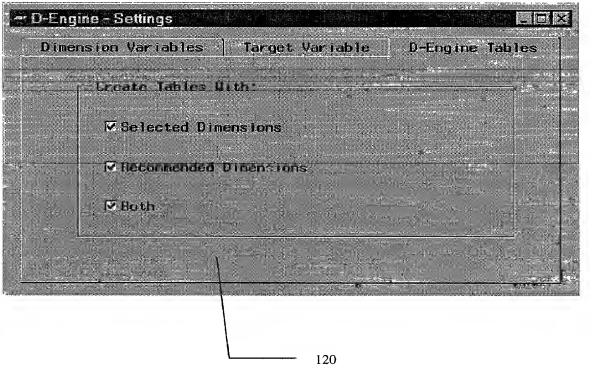

D-Engine - Settings
Dimension Variables
Target Variable
D-Engine Tables
Create Tables With:
Selected Dimensions
Recommended Dimensions
Both
120

FIG.8

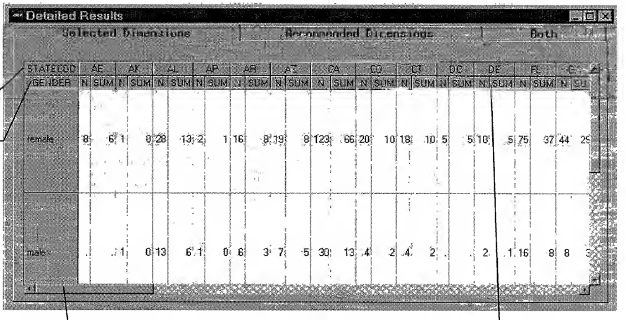

Detailed Results
Selected Dimensions
Recommended Dimensions
Both
STATECOD
AE
AK
AL
AP
AR
AZ
CA
CO
CT
DC
DE
FL
GE
GENDER
N
SUM
female
male
132
134
130
136

FIG. 9

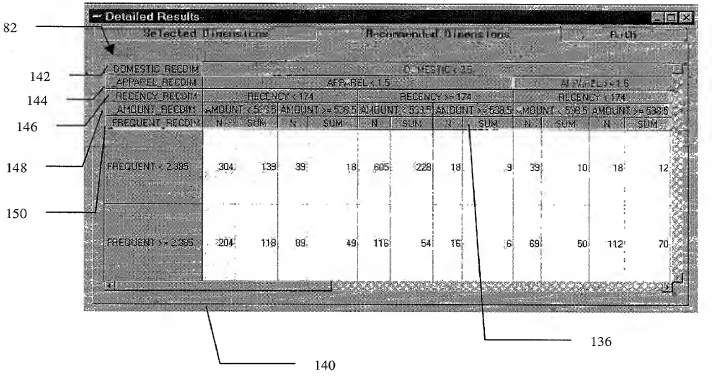

Detailed Results
Selected Dimensions
Recommended Dimensions
Both
DOMESTIC_RECDIM
DOMESTIC < 3.5
APPAREL_RECDIM
APPAREL < 1.5
RECENCY_RECDIM
RECENCY < 174
RECENCY >= 174
AMOUNT_RECDIM
FREQUENT_RECDIM
N
SUM
FREQUENT < 2.385
304
139
39
18
605
228
18
9
39
10
18
12
FREQUENT >= 2.385
204
118
89
49
116
54
15
6
69
50
112
70
82
142
144
146
148
150
136
140

FIG. 10

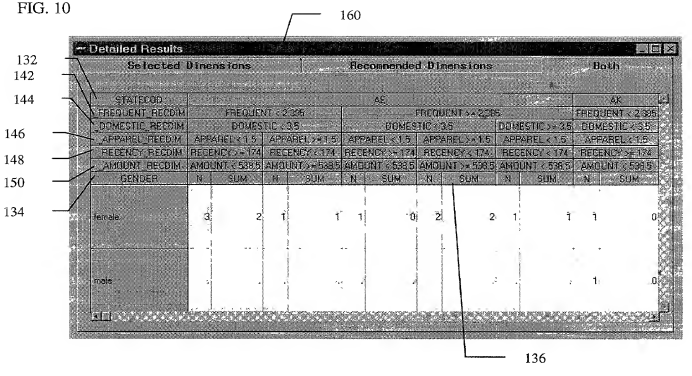

160
132
142
144
146
148
150
134
136
Detailed Results
Selected Dimensions
Recommended Dimensions
Both
STATECOD
AE
AK
FREQUENT_RECDIM
FREQUENT < 2.335
FREQUENT >= 2.335
FREQUENT < 2.335
DOMESTIC_RECDIM
DOMESTIC < 3.5
DOMESTIC >= 3.5
DOMESTIC < 3.5
APPAREL_RECDIM
APPAREL < 1.5
APPAREL >= 1.5
RECENCY_RECDIM
RECENCY < 174
RECENCY >= 174
AMOUNT_RECDIM
AMOUNT < 538.5
AMOUNT >= 538.5
GENDER
N
SUM
female
male

FIG. 11

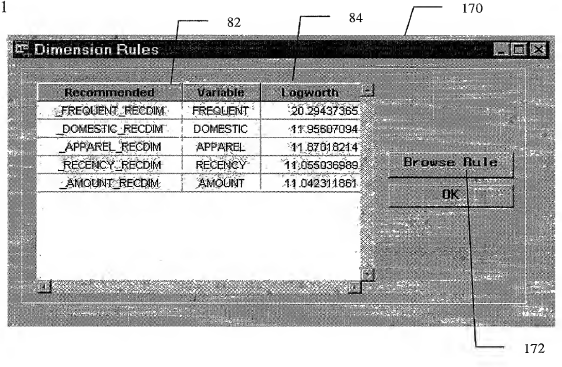

82
84
170
Dimension Rules
Recommended
Variable
Logworth
_FREQUENT_RECDIM
FREQUENT
20.29437365
_DOMESTIC_RECDIM
DOMESTIC
11.95607094
_APPAREL_RECDIM
APPAREL
11.87018214
_RECENCY_RECDIM
RECENCY
11.055036989
_AMOUNT_RECDIM
AMOUNT
11.042311861
Browse Rule
OK
172

FIG. 12

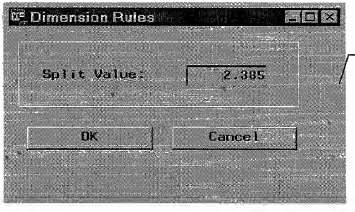

Dimension Rules
Split Value:
2.385
OK
Cancel
180

FIG. 13

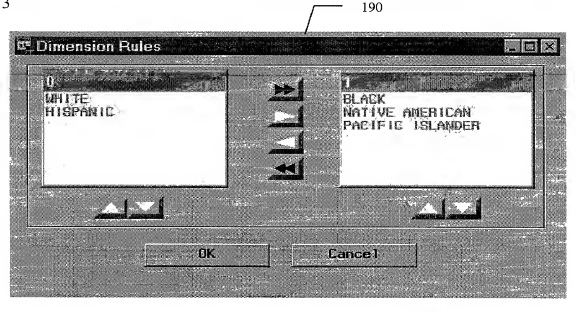

190
Dimension Rules
0
WHITE
HISPANIC
1
BLACK
NATIVE AMERICAN
PACIFIC ISLANDER
OK
Cancel

FIG. 14

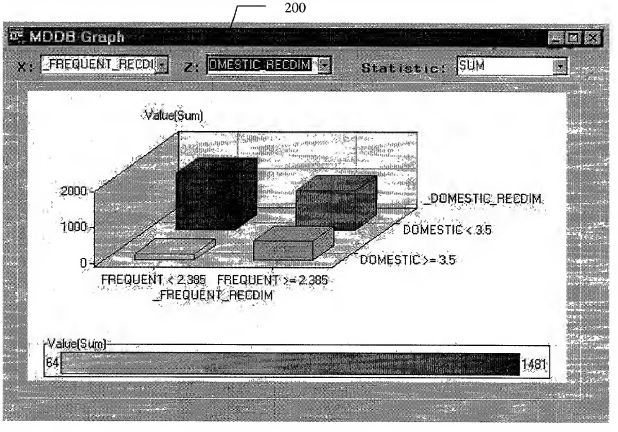

200
MDDB Graph
X: _FREQUENT_RECDI
Z: DMESTIC_RECDIM
Statistic: SUM
Value(Sum)
2000
1000
0
_DOMESTIC_RECDIM
DOMESTIC < 3.5
DOMESTIC >= 3.5
FREQUENT < 2.385
FREQUENT >= 2.385
_FREQUENT_RECDIM
Value(Sum)
64
1481

FIG. 15A

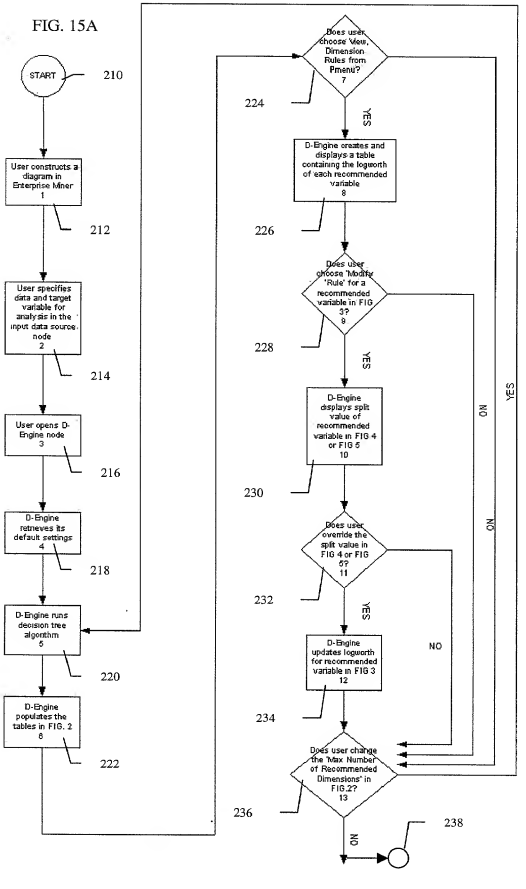
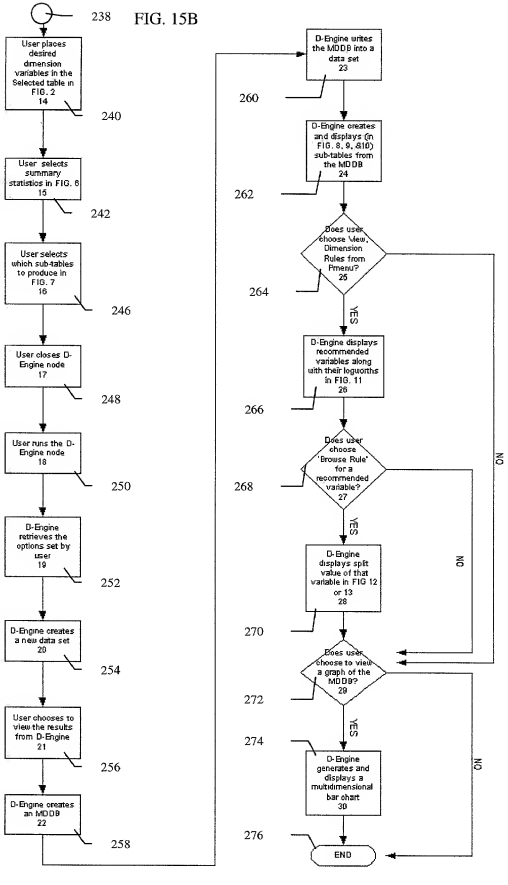

START
210
User constructs a diagram in Enterprise Miner
1
212
User specifies data and target variable for analysis in the input data source node
2
214
User opens D-Engine node
3
216
D-Engine retrieves its default settings
4
218
D-Engine runs decision tree algorithm
5
220
D-Engine populates the tables in FIG. 2
6
222
Does user choose 'View, Dimension Rules from Pmenu'?
7
224
YES
D-Engine creates and displays a table containing the logworth of each recommended variable
8
226
Does user choose 'Modify 'Rule' for a recommended variable in FIG 3?
9
228
YES
D-Engine displays split value of recommended variable in FIG 4 or FIG 5
10
230
Does user override the split value in FIG 4 or FIG 5?
11
232
YES
D-Engine updates logworth for recommended variable in FIG 3
12
234
NO
Does user change the 'Max Number of Recommended Dimensions' in FIG.2?
13
236
NO
238
NO
NO
YES

FIG. 15B


238
User places desired dimension variables in the Selected table in FIG. 2
14
240
User selects summary statistics in FIG. 6
15
242
User selects which sub-tables to produce in FIG. 7
16
246
User closes D-Engine node
17
248
User runs the D-Engine node
18
250
D-Engine retrieves the options set by user
19
252
D-Engine creates a new data set
20
254
User chooses to view the results from D-Engine
21
256
D-Engine creates an MDDB
22
258
D-Engine writes the MDDB into a data set
23
260
D-Engine creates and displays (in FIG. 8, 9, &10) sub-tables from the MDDB
24
262
Does user choose 'view Dimension Rules from Pmenu?
25
264
YES
D-Engine displays recommended variables along with their logworths in FIG. 11
26
266
Does user choose 'Browse Rule' for a recommended variable?
27
268
NO
YES
D-Engine displays split value of that variable in FIG 12 or 13
28
270
NO
Does user choose to view a graph of the MDDB?
29
272
NO
YES
274
D-Engine generates and displays a multidimensional bar chart
30
276
END

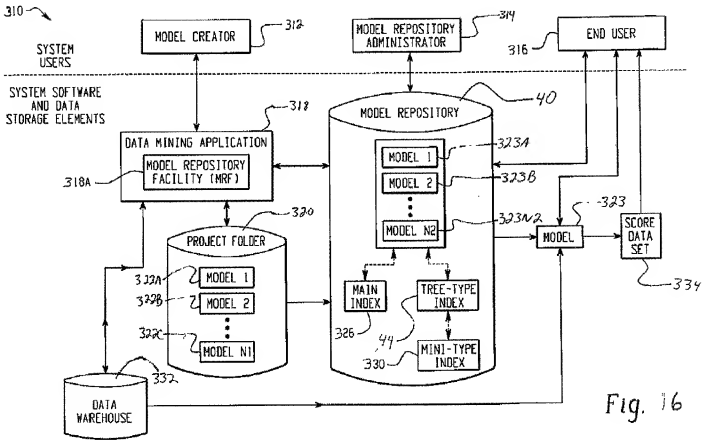

310
SYSTEM USERS
SYSTEM SOFTWARE AND DATA STORAGE ELEMENTS
MODEL CREATOR
312
MODEL REPOSITORY ADMINISTRATOR
314
END USER
316
DATA MINING APPLICATION
318
MODEL REPOSITORY FACILITY (MRF)
318A
MODEL REPOSITORY
40
MODEL 1
323A
MODEL 2
323B
MODEL N2
323N2
323
MODEL
SCORE DATA SET
334
PROJECT FOLDER
320
MODEL 1
323A
MODEL 2
323B
MODEL N1
323C
MAIN INDEX
326
TREE-TYPE INDEX
44
MINI-TYPE INDEX
330
DATA WAREHOUSE
332

Fig. 16

PATENT OFFICE

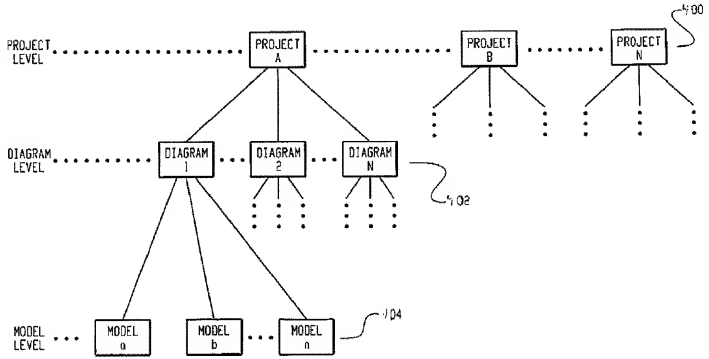


Fig. 17

PATENT APPLICATION

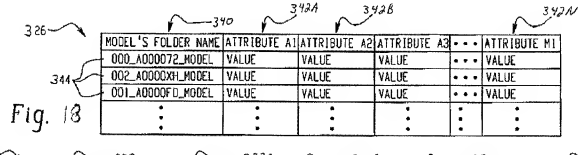


Fig. 18

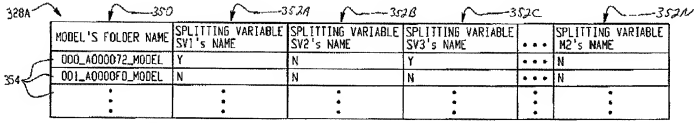


Fig. 19

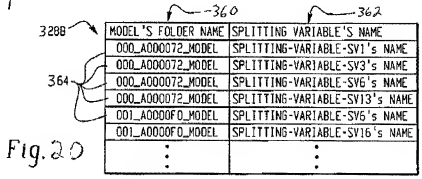


Fig. 20

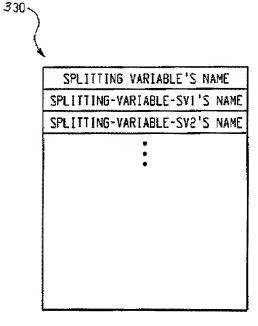

330
SPLITTING VARIABLE'S NAME
SPLITTING-VARIABLE-SV1'S NAME
SPLITTING-VARIABLE-SV2'S NAME

Fig. 21

FIG. 22

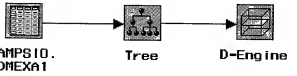



FIG. 23